

Successfully Transitioning Science Research to Space Weather Applications

James Spann, NASA/MSFC

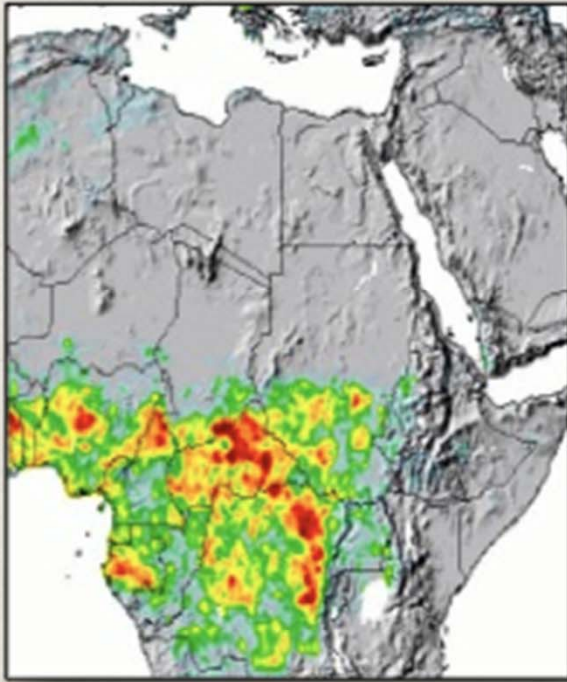
Fall AGU 2012

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- ❖ Two examples
- ❖ Commitment
- ❖ Culture
- ❖ Clarity
- ❖ Cycle
- ❖ Check
- ❖ Conclusions



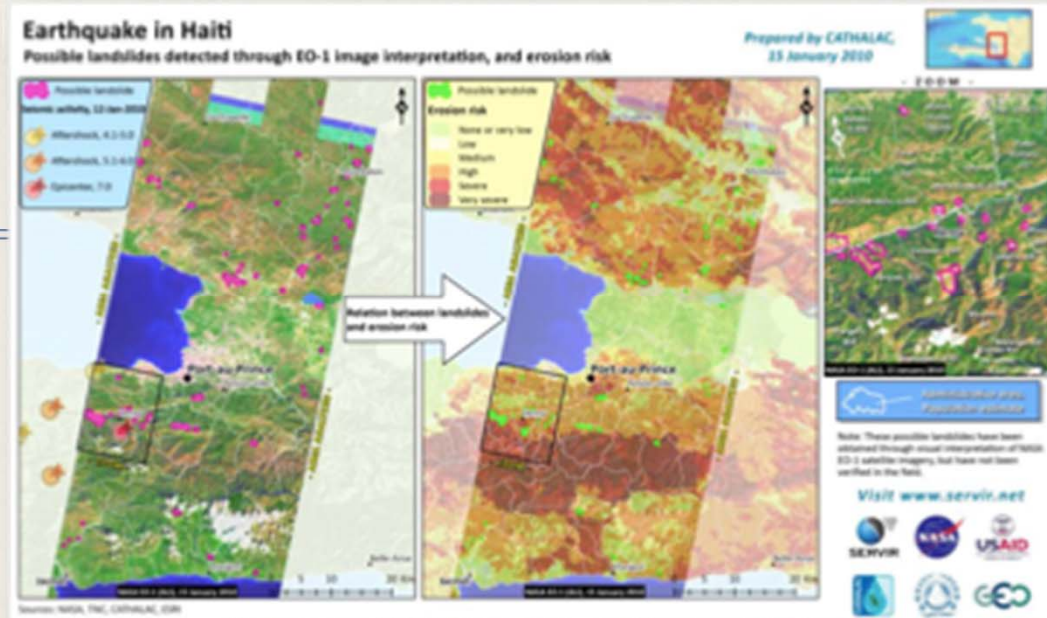
- ❖ SERVIR—the Regional Visualization and Monitoring System—helps government officials, managers, scientists, researchers, students, and the general public make decisions by providing Earth observations and predictive models based on data from orbiting satellites. The SERVIR system helps nations in Mesoamerica, East Africa, and the Himalayan regions cope with: disasters, ecosystems, biodiversity, weather, water, climate, health, and agriculture.
- ❖ Works hand-in-hand with the State Department USAID program
- ❖ http://www.nasa.gov/mission_pages/servir/index.html
- ❖ Dan Irwin - Head of SERVIR



Flood Forecasting in Africa



Mapping Fires in Guatemala Mexico



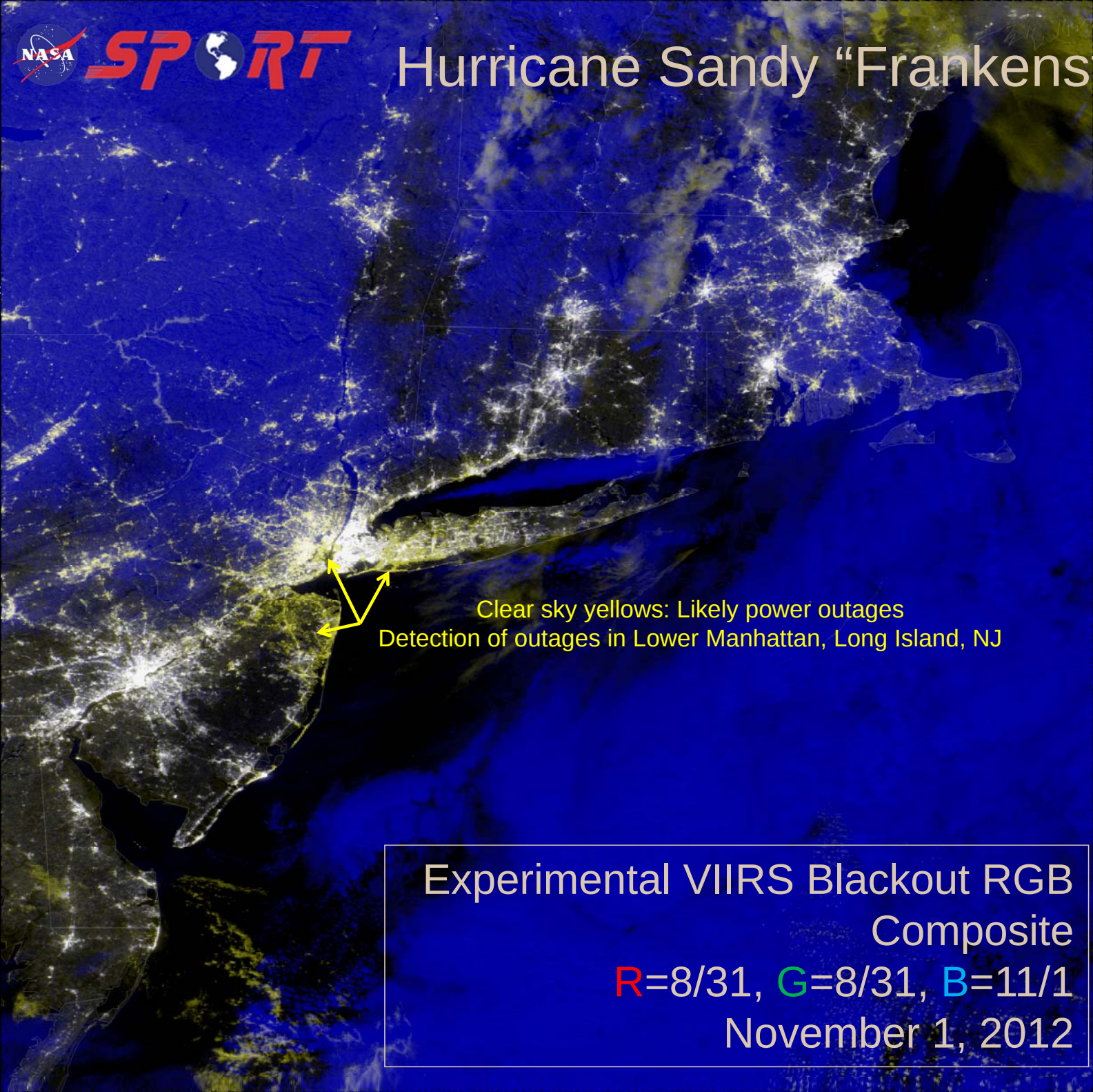
Earthquake in Haiti



- ❖ Short-term Prediction Research and Transition (SPoRT) Center is a NASA project to transition unique observations and research capabilities to the operational weather community to improve short-term forecasts on a regional scale.
- ❖ Works hand-in-hand with NOAA National Weather Service
- ❖ <http://weather.msfc.nasa.gov/sport/>
- ❖ Dr. Gary Jedlovec - Head of SPoRT



Hurricane Sandy "Frankenstorm"

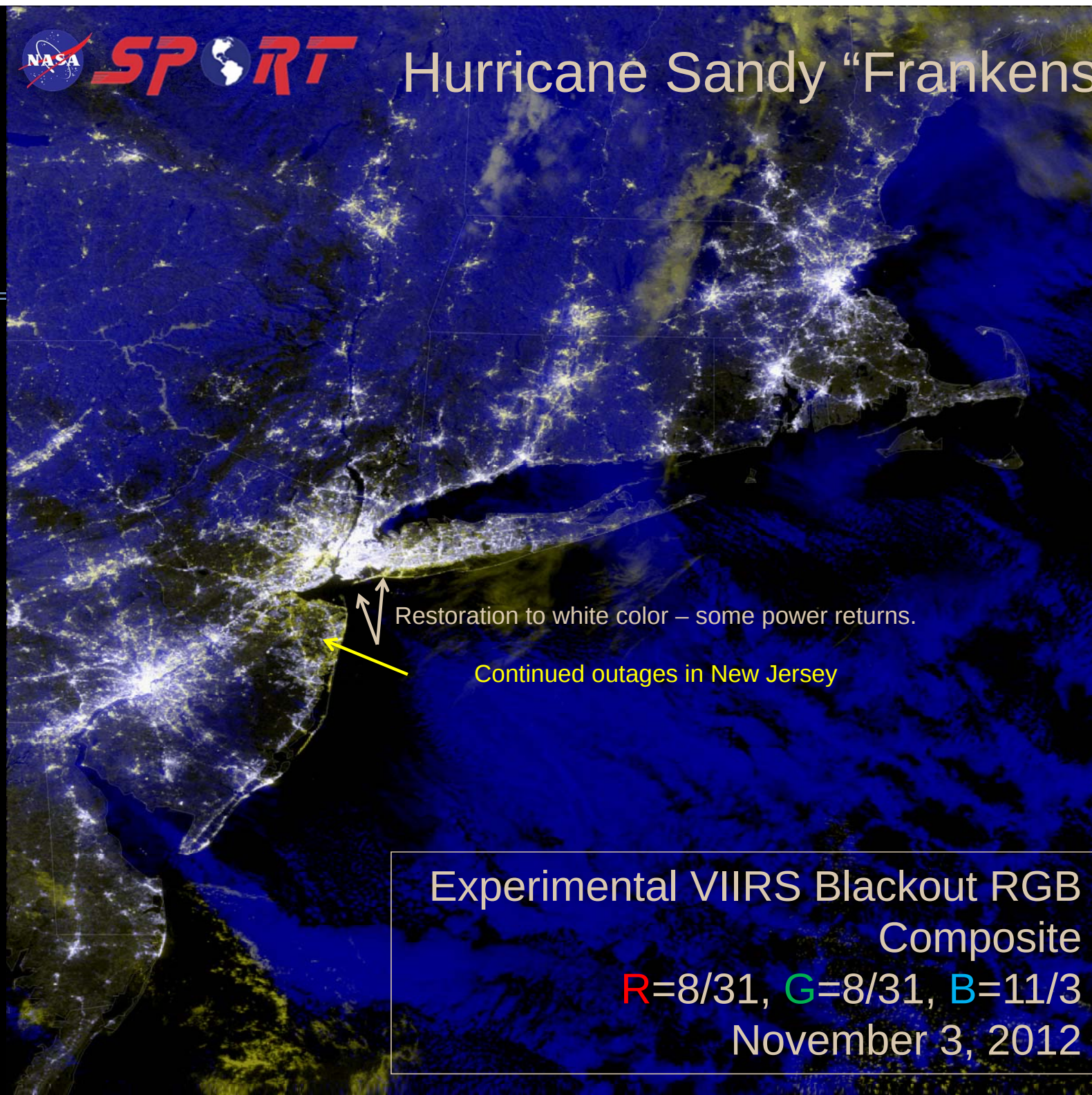
A satellite image of Hurricane Sandy, also known as "Frankenstorm", over the Northeast United States. The storm's eye is visible as a dark circular feature over the Atlantic Ocean. The surrounding cloud cover is shown in various shades of blue and white. Yellow arrows point to specific areas of clear sky over the New York City area and Long Island, which are identified as power outages.

Clear sky yellows: Likely power outages
Detection of outages in Lower Manhattan, Long Island, NJ

Experimental VIIRS Blackout RGB
Composite

R=8/31, G=8/31, B=11/1
November 1, 2012

Hurricane Sandy “Frankenstorm”



Experimental VIIRS Blackout RGB
Composite

R=8/31, G=8/31, B=11/3

November 3, 2012



SPORT

Hurricane Sandy “Frankenstorm”

Much of the major outages restored –
remaining outages may be below the satellite resolution.

Experimental VIIRS Blackout RGB
Composite

R=8/31, **G**=8/31, **B**=11/6

November 6, 2012

Commitment

- ❖ Nothing happens overnight
- ❖ There has to be a commitment on both sides:
 - ❖ research/operations
 - ❖ science/applications
 - ❖ provider/user
- ❖ Commitment must exist at all levels; from management down to implementer and user
- ❖ End-User engagement from the beginning is important

Culture

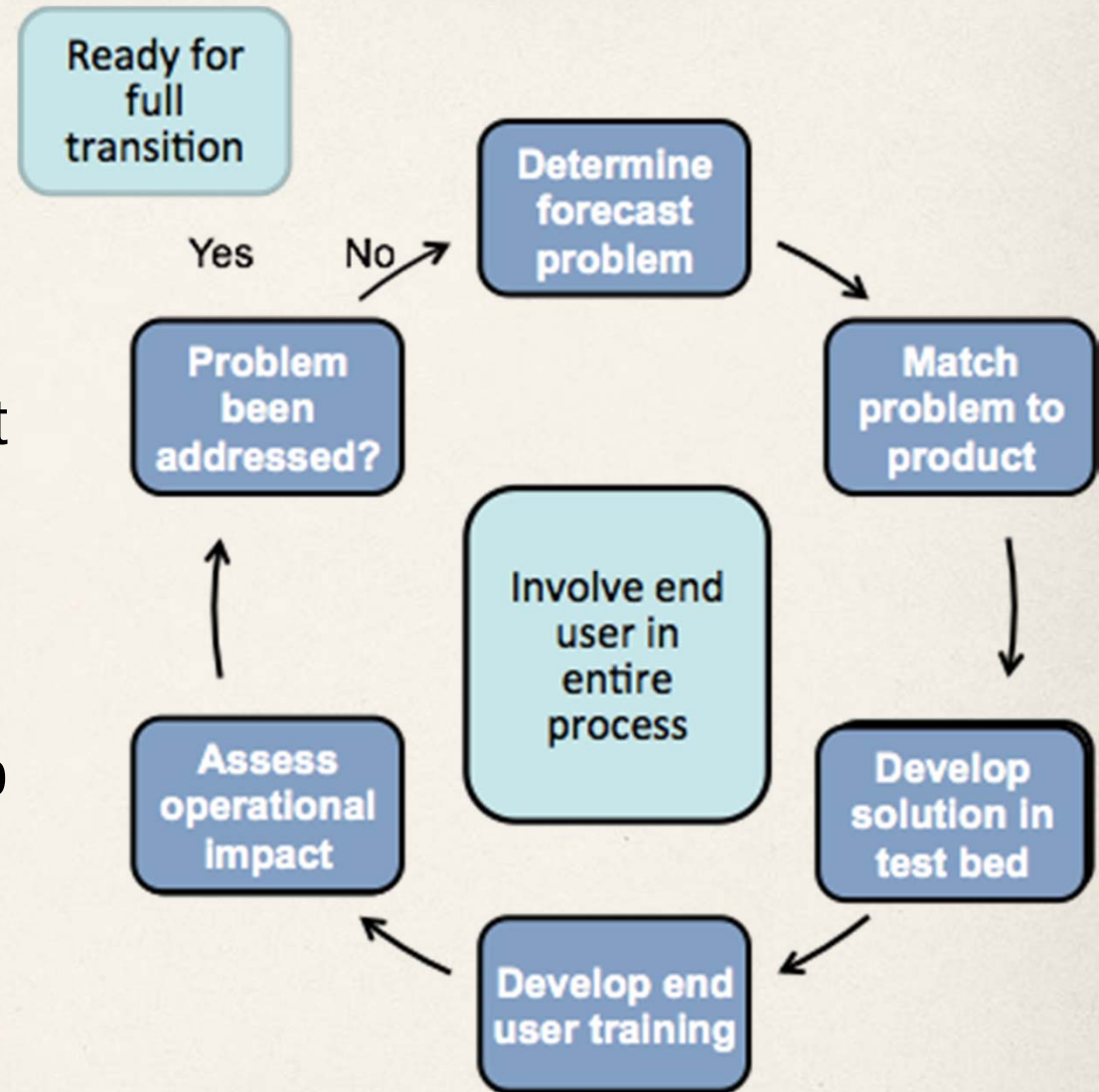
- ❖ The provider and user exist in very different cultures
 - ❖ Provider (researcher)
 - ❖ focuses on detail, perfection
 - ❖ how things work
 - ❖ scientific method
 - ❖ User
 - ❖ just want it to work
 - ❖ doesn't care about some of the details
- ❖ The researcher must live in the user world long enough to understand it - not the other way around

Clarity

- ❖ Clearly identify the needs and requirements
- ❖ Reassess needs and requirements on a frequent and regular basis
- ❖ Identify conditions of satisfaction for the end user
- ❖ Involve the user in the entire process
- ❖ The user must have some investment in the product in order for them to eventually own it

SPoRT Cycle

- ❖ match forecast challenge to data or product
- ❖ develop solution / demonstrate in “test bed” environment
- ❖ integrate successful products into end user’s decision support tools
- ❖ create product training
- ❖ perform product assessment
- ❖ Maintain interactive partnership with end user throughout process
- ❖ Need local end user advocate for product
- ❖ Endorsement from all levels of end user organization



Reality Check

- ❖ Just because we (i.e. researchers) have provided a great product, the user will adjust to it - **NOT**
- ❖ Often user does not have the resources to receive and ingest the product
- ❖ In the cases of SERVIR and SPoRT, USAID and NWS provide capacity to the receiver to ingest the product
- ❖ Recognize and understand the difference between research, building tools, and transition process
- ❖ Must be intentional to successfully transition – not a weekend activity

Conclusion

- ❖ We have a lot to learn from our Earth Science colleagues
- ❖ They have been at this much longer than we have
- ❖ But we have a future
- ❖ This is an area of growth in the discipline because it brings a new dimension, an applied dimension
- ❖ Transitioning must be **intentional** and be able to stand on its own